

# DUB72D724EX



## DC Double Under Voltage Level monitoring relay



### Benefits

- **Under + Under Voltage setting.** The user can set a double under voltage threshold, by two independent dials.
- **20A + 3A relay outputs.** The two relay outputs, each one associated to one of the set thresholds, can be used to drive different types of loads: the 3A can be used to send a signal to a PLC while the 20A, thanks to its high capacity, could directly drive the load.
- **Bicolour Alarm LED indication.** A green/red LED provides a visual indication of the alarm status. The number of RED blinks indicates the triggered alarm type.
- **Hazardous location installation.** Thanks to the Class I div. 2 compliance, according to ISA12.12.1 Norm, the DUB72 is suitable for the installation in zone 2 of potentially explosive environments.
- **Tropicalized PCB.** The PCB tropicalization increases the operation reliability also in humid and dusty environments.

### Description

DUB72 is a DC double under-voltage-thresholds monitoring relay, with two independent relays, one for each of the 2 thresholds, measuring the level of its power supply.

One of the thresholds, the one associated with the lower rating relay, can be used as a pre-alarm signal; the other one is associated with a high-power 20A-rated relay which can be used to drive the load directly.

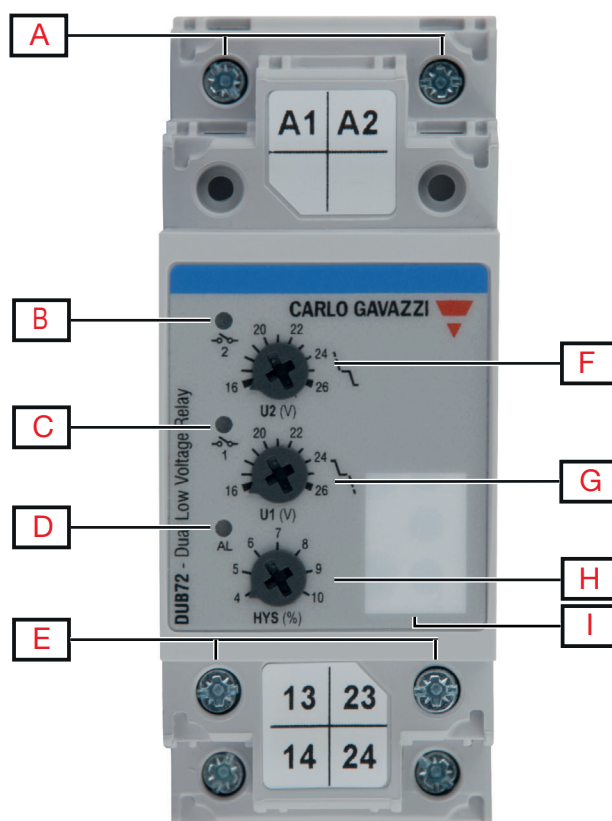
This device is designed according to the Class I Div. 2 classification of the ISA12.12.1 hazardous location installation norm.

It features a low-profile DIN housing suitable for installation into electric distribution panels as well as industrial cabinets.

### Applications

As the DUB72 complies with the hazardous location installation norm, it is hence suitable for 24V-battery-voltage level monitoring, or any other DC voltage within the operating range, in any environment including Zone 2 of potentially explosive environments. It is suitable for applications where it is necessary to monitor the battery charge level in Oil & Gas installations or grain bins.

## Structure



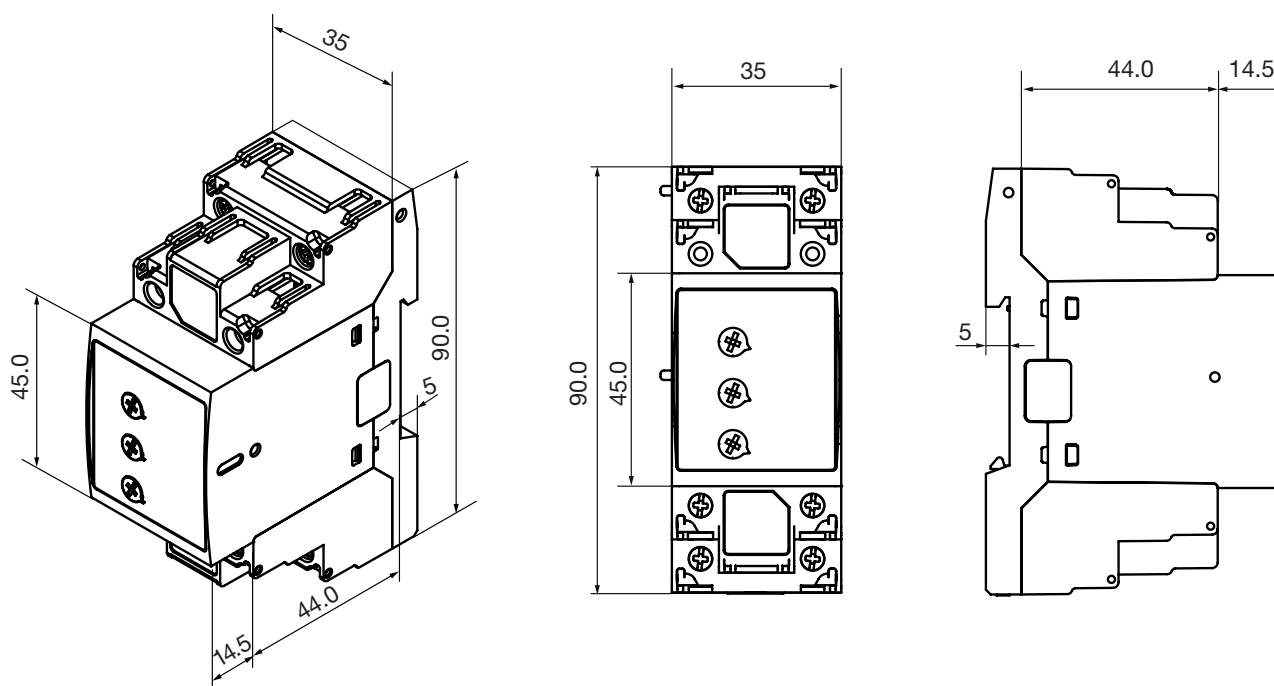
Element	Component	Function
A	Power supply terminals	A1 and A2 supply and measuring terminals
B	LED "2"	ON when relay 2 ( Output 2) energized
C	LED "1"	ON when relay 1 (Output 1) Energized
D	Alarm LED	Green: OK (Power ON, no alarm present)
		1 RED Flash: U1 Undervoltage
		2 RED Flashes: U2 Undervoltage
E	Output terminals	Output relay contacts terminals
	13-14	Output 1
	23-24	Output 2
F	U2 Dial	Undervoltage 2 setting dial. This is associated to the Output 2, should be set to a lower voltage level than U1 and use it as an alarm.
G	U1 Dial	Undervoltage 1 setting dial. This is associated to the Output 1, should be set to a higher voltage level than U2 and use it as a pre-alarm notification.
H	HYS Dial	Hysteresis level can be set by means of this dial between 4% to 10% of the selected voltage value
I	Identification area	Area for device identification marking



## Features

### General

<b>Housing material</b>	Nylon
<b>Assembly</b>	DIN rail mounting (According to EN 50022)
<b>Degree of protection</b>	IP20
<b>Weight</b>	110g



### Power Supply

<b>Power supply</b>	Voltage range	15VDC to 30VDC
	Voltage type	DC, Ripple $\leq$ 5% Self-powered from reading terminals
<b>Consumption</b>	1.5W	

### Environmental



<b>Operating temperature</b>	-25° C to 60° C (-13° F to 140° F)
<b>Storage temperature</b>	-30°C to 80°C (-22° F to 176° F)
<b>Relative humidity</b>	up to 95% non-condensing
<b>Pollution degree</b>	2
<b>Operating max altitude</b>	2000m
<b>Salinity</b>	No saline environment
<b>UV resistance</b>	No UV exposure
<b>Other</b>	Zone 2 hazardous locations installation, with possible presence of Oil or Petrol gases

Vibration/Shock resistance	
<b>Tests with the device outside the box:</b> <b>Vibration response (IEC60255-21-1)</b> <b>Vibration endurance (IEC 60255-21-1)</b> <b>Shock (IEC 60255-21-2)</b> <b>Bump (IEC 60255-21-2)</b>	Class1 Class1 Class1 Class1
<b>Tests with the device inside the box:</b> <b>Vibration, random (IEC60068-2-64)</b> <b>Shock (IEC 60255-21-2)</b> <b>Bump (IEC 60255-21-2)</b>	Class1 Class1 Class1

Note:

Class 1: normal use in industrial plants, normal transportation condition.

## ► Compatibility and conformity

Approvals	 
CE-marking	LV directive, EMC directive EN 60947-5-1
cULus Marking	UL 508 CSA Standard C22.2 No. 14-10 – Industrial control equipment
Hazardous Locations approvals	UL 508 CSA Standard C22.2 No. 14-10 – Industrial control equipment CSA Standard C22.2 No. 213-M1987 (R2008) - Non-incendive Electrical Equipment for Use in Class I, division 2 Hazardous Locations ANSI/ISA 12.12.01-2010 – Non-incendive Electrical Equipment for Use in Class I, Division 2 Hazardous (Classified) Locations RoHS Directive

## ► Inputs

Measuring ranges	
Variable measuring	DC Voltage line measurement on A1 and A2

Voltage measurement	
Typology	DC Voltage line measurement on A1 and A2
Range for DC Line	15V to 30V
Adjustable Threshold range	16V to 26V
Overload range	< 15V or >30V
Repeatability	0.1V
Refresh time	According to alarms response time

UNDERVOLTAGE1 alarm	
Input variables	Under-voltage, configurable with Trimmer U1
Reaction time	≤ 250ms
Hysteresis	From 4 to 10% of the selected voltage value (e.g. HYS 5%, voltage value 20V, Hysteresis 1V)
Delay ON	None
Delay OFF	None

UNDERVOLTAGE2 alarm	
Input variables	Under-voltage, configurable with Trimmer U2
Reaction time	≤ 250ms
Hysteresis	From 4 to 10% of the selected voltage value (e.g. HYS 5%, voltage value 18V, Hysteresis 0.9V)
Delay ON	None
Delay OFF	None

## Outputs

Output 1	
Type	SPST Normally Open electromechanical relay
Logic	De-energized on alarms
Assignment	Associated to U1 dial setting
Contact rating	3A @ 30VDC nominal, resistive load 3A @ 250VAC nominal, resistive load
Electrical lifetime	200*10 <sup>3</sup> operations
Connector characteristics	Screw; Wire size: from 0.5mm <sup>2</sup> to 6mm <sup>2</sup> (from AWG20 to AWG10) stranded or solid
Tightening torque	From 0.4Nm to 1Nm

Output 2	
Type	SPST Normally Open electromechanical relay
Logic	De-energized on alarms
Assignment	Associated to U2 dial setting
Contact rating	20A @ 28VDC nominal, resistive load 20A @ 250VAC nominal, resistive load
Electrical lifetime	50*10 <sup>3</sup> operations
Connector characteristics	Screw; Wire size: from 0.5mm <sup>2</sup> to 6mm <sup>2</sup> (from AWG20 to AWG10) stranded or solid
Tightening torque	From 0.4Nm to 1Nm

## Interface

UNDERVOLTAGE 1 Adjustment Dial	
Typology	Linear selection from 16V to 26V
Resolution	1V / notch
Accuracy	Absolute +/-0.5V (e.g. trimmer position on notch 18V => set value from 17.5V to 18.5V)
Repeatability	Absolute +/-0.1V (e.g. set value 18V => variation from 17.9V to 18.1V)
Function	Selection relative voltage threshold of the UNDERVOLTAGE1



UNDERVOLTAGE 2 Adjustment Dial	
Typology	Linear selection from 16V to 26V
Resolution	1V / notch
Accuracy	Absolute +/-0.5V (e.g. trimmer position on notch 18V => set value from 17.5V to 18.5V)
Repeatability	Absolute +/-0.1V (e.g. set value 18V => variation from 17.9V to 18.1V)
Function	Selection relative voltage threshold of the UNDERVOLTAGE2

HYSTERESIS Adjustment Dial	
Typology	Linear selection from 4% to 10% of the selected voltage value
Resolution	1% / notch
Accuracy	Absolute +/-0.5V (e.g. trimmer position on notch 6% => set value from 5.5% to 6.5%)
Repeatability	Absolute +/-0.1V (e.g. set value 6% => variation from 5.9% to 6.1%)
Function	Selection of the hysteresis for the undervoltage 1 and undervoltage 2 alarm thresholds

LEDs	
LED 1	Output 1 LED
LED 2	Output 2 LED
LED "AL"	Alarm discrimination LED (see table)

Status	OUTPUT relay 1	OUTPUT relay 2	LED 1	LED 2	LED AL
Power ON OK	ON	ON	ON	ON	Green, steady ON
Undervoltage 1	OFF	ON	OFF	ON	1 RED pulse
Undervoltage 2	ON	OFF	ON	OFF	2 RED pulses
Undervoltage 1 & 2	OFF	OFF	OFF	OFF	3 RED pulses

## Insulation

Terminals	Overvoltage category III
From inputs A1, A2 to outputs 13, 14	For nominal voltage up to 250Vrms, basic insulation: 2.5KVrms, 4KV impulse 1.2/50µs
From inputs A1, A2 to outputs 23, 24	For nominal voltage up to 250Vrms, basic insulation: 2.5KVrms, 4KV impulse 1.2/50µs
From outputs 13, 14 to outputs 23, 24	For nominal voltage up to 250Vrms, basic insulation: 2.5KVrms, 4KV impulse 1.2/50µs

## Operation description

24V Power supply level is measured by the DUB72. If the voltage is above both set overvoltage levels, the AL LED is steady ON green, both output relays are energized, and LED 1 and LED 2 are illuminated.

When the supply voltage level falls below one or both of the set undervoltage levels, the related output relay is de-energized, the LED turns off and, consequently, the output opens. The AL LED shows the triggered alarm type.

When the voltage rises above the undervoltage set level plus the hysteresis, the related output relay is energized, the LED turns ON and the output closes.